SOUTHWEST FISHERIES CENTER
HONOLULU LABORATORY
2570 DOLE STREET
HONOLULU, HAWAII 96822-2396
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ANNUAL REPORT OF THE 1993 WESTERN PACIFIC LONGLINE FISHERY

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ROBERT A. DOLLAR

Honolulu Laboratory
Southwest Fisheries Science Center
National Marine Fisheries Service, NOAA
Honolulu, Hawaii 96822-2396

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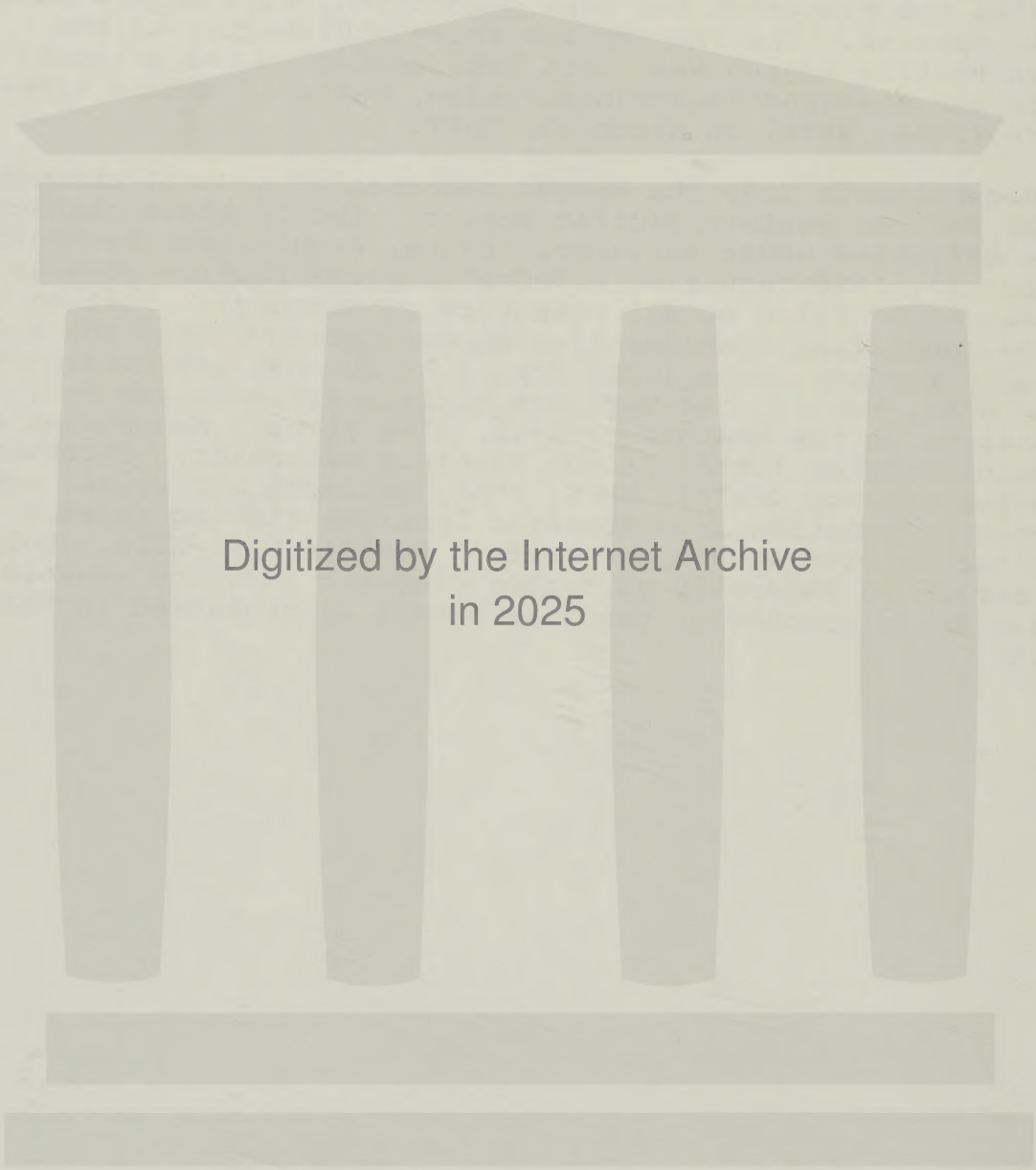
PREFACE

The Western Pacific Regional Fishery Management Council (WPRFMC) developed the Pelagic Species fishery management plan (FMP) to manage the pelagic resources authorized by the Magnuson Fishery Conservation and Management Act of 1976. This FMP regulates the fisheries for tuna, swordfish, marlin, and other pelagic species. The FMP for the Pelagic Fisheries of the Western Pacific Region was first implemented by the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA, NMFS) on March 23, 1987.

Beginning in 1990 the WPRFMC recommended several changes to the FMP for the Western Pacific Region. Two of these changes became effective under emergency Federal regulations beginning November 27, 1990 requiring Federal longline fishing permits and logbooks to be filed by all operators of commercial fishing vessels conducting longline fishing operations within the U.S. Exclusive Economic Zone (EEZ) from 3 to 200 nmi offshore American Samoa, Guam, Hawaii, the Northern Mariana Islands, and U.S. possessions in the western Pacific. The Fishery Management and Economics Program (FMEP) of the Honolulu Laboratory, Southwest Fisheries Science Center, NMFS, NOAA, collects biological and economic information from domestic longline fishing vessels permitted to fish within the western Pacific U.S. EEZs. Only information on federally permitted domestic longline vessels landing their catches or based in Hawaii is presented in this report.



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INTRODUCTION

Historically, domestic longline fishing vessels have operated in the Hawaiian Islands since the early 1900s. In recent years, the pelagic longline fishery has grown to be the largest and most prominent domestic commercial fishery in Hawaii. The number of permitted longline vessels has increased from approximately 37 vessels in 1987 (Kawamoto et al., 1989) to 167 vessels by the end of 1993. Initially, the Western Pacific Regional Fishery Management Council's (WPRFMC) fishery management plan (FMP) for pelagic species relied on shoreside monitoring by the National Marine Fisheries Service's (NMFS) Fishery Management and Economics Program (FMEP) for longline off-loading data and on the HDAR commercial fishing catch reports for landings and fishing effort data. However, with the dramatic expansion of the fishery, the increased interaction between the longliners and various small trollers and handliners, and reports of interactions between the longline vessels operating in the Northwestern Hawaiian Islands (NWHI) and endangered Hawaiian monk seals (see Table 1 for scientific names), a Federal logbook system for domestic longliners operating in the western Pacific region (Fig. 1) was implemented in November 1990.

Information on current landings, fishing effort, catch-per-unit-effort (CPUE), vessel operations, and interactions with endangered and protected species included in this report are all based on Federal longline logbook data by Hawaii-based longline vessels reported to the NMFS, FMEP for 1993. Logbook procedures are summarized in Dollar and Yoshimoto (1991).

RECENT DEVELOPMENTS

There were several changes affecting the longline fishery in Hawaii in 1993. A final rule became effective to revise requirements for marking and identifying fishing gear used by operators of domestic and foreign pelagic longline fishing vessels operating under the FMP. The rule required operators of permitted longline vessels to mark all longline buoys and floats deployed in the EEZ or maintained on board the vessel. The regulations previously required operators of permitted longline fishing vessels to mark floats and buoys only when attached to deployed longline gear. The final rule also allows for the confiscation of unmarked longline gear that is found deployed in the EEZ. This revision is designed to reduce the possibility of abandoned longline gear impacting other fisheries or protected species.

Other developments during 1993 involved the groundwork and preparation of Amendment 7 to the FMP establishing a new limited entry (LE) program to replace the existing moratorium which expired in April 1994. This rule would provide for any LE permit holder whose vessel made at least one landing of longline-caught fish during the moratorium to be eligible for a LE permit under the new program; allow for persons with LE permits on vessels less than 40 feet in length or with LE permits based on the participation in the NWHI lobster fishery criterion to be exempt from the landing requirement; allow all permit holders to upgrade their vessels to the length of the longest vessel which was active during the moratorium (101 ft); grant permits to be freely transferable with or without the vessel; establish a one-permit system for longliners holding a Hawaii LE permit to fish throughout the western Pacific region (currently, a General Permit is required in addition to the LE permit); allow nonpermitted domestic longline vessels permission to transit the EEZ and enter Hawaii ports to resupply providing they do not off-load their fish; add moonfish, pomfret, and oilfish to the Pacific pelagic management unit species; and assess fees for processing longline permit applications. The final rule was published in the Federal Register in May 1994 and became effective June 24, 1994.

A topic of much interest over the past year among longline vessel operators, industry personnel, and NMFS scientists alike was the mandatory observer program and electronic vessel monitoring system (VMS). Observers from the NMFS began embarking on Hawaii-based longline vessels on a voluntary basis during the last quarter of 1993. An interim final rule issued by the Secretary of Commerce required all permit holders of Hawaii-based longline vessels to give notification of departure and accommodate observers on a mandatory basis beginning in January 1994. A VMS requirement which would equip all permitted vessels with a tracking system that would allow NMFS to monitor the vessels' positions while they are at sea, could possibly be in operation by the end of 1994. The above requirement was deemed necessary by the NMFS to ensure adequate reporting of interactions between longline fishing gear and sea turtles. Hawaii longline logbook data and volunteer observer data prior to January 1994 indicated that sea turtle interactions or "take" had been exceeded under the original Biological Opinion. Consequently, there was potential for shutting down the Hawaii longline fishery entirely unless the above measures were initiated.

As in any new program, there were mixed emotions and response to this requirement while the logistics were being sorted out. Longline vessel operators viewed this new rule as being more "bureaucratic overregulation" of the fishery and causing more complications for the fishermen to deal with in order to fish. Many longline operators were confused about how to contact NMFS about departure information and request observer

placements. Under the new rule, permit holders are required to notify the NMFS Port Field Station in Honolulu at least 72 hours, not including weekends and Federal holidays, before leaving from any Hawaii port to begin a fishing trip (before they were only required to notify the Pacific Area Office (PAO) within 12 hours of arrival) (Fig. 2). The observers attempted to accommodate and inform the longline vessel operators about the new regulations, but some permit holders were especially adamant about not having female observers aboard their vessels. This was the result of traditional beliefs among fishermen that women are bad luck on board vessels at sea and problems either perceived or real, concerning complaints about female observers received from the wives of captains and crew members.

Shark landings more than quadrupled during 1993 from the amount landed in 1992, and the number of sharks reported as caught increased by more than a third. The number of blue sharks reported caught were exceptionally high in 1993, especially during July through September when fishing effort and catch rate for other pelagic species have historically been depressed. This may be a result of more longline operators "finning" blue sharks when catch rates for swordfish or tuna are poor (see Catch and Landings section).

Bluefin tuna were landed in increasing numbers in 1993 by the longline fishery as the fleet ranged further north and west from Hawaii. Conceivably, this trend could initiate a new target species for Hawaii-based longliners in the future since the average price of bluefin at the wholesale market level exceeded the average price of other tuna species fivefold during 1993. There is no direct comparison between the 1993 catch of bluefin tuna and that of previous years, since no significant numbers of bluefin were landed prior to 1993. In addition, bluefin tuna were combined with skipjack tuna in the "other tuna" category in the longline logbooks during 1993, so the actual number caught is not available. However, average sampling weights from wholesale market monitoring in Honolulu suggest that landings of bluefin tuna approximated 207,000 pounds, worth an estimated $2.85 million in 1993. At the beginning of 1994, FMEP assigned bluefin tuna a separate logbook code in order to obtain information for this species in the future.

LONGLINE FLEET OPERATIONS

At the close of 1993 there were 167 LE-permitted vessels registered in Hawaii. The following is an abstract account of

active[1] and inactive LE permit holders in the domestic longline fishery during the year:

Active: 122
Inactive: 18
Fishing out of state: 14
Fishing other Hawaii fisheries: 1
Permit but no vessel: 10

The permit holder's vessels listed as inactive, were either under repair, impounded, for sale, handlining, or inactive for unknown reasons.

Longline LE vessels in Hawaii have been categorized by FMEP into three classes by overall length. In 1993, there were 42 small class vessels (less than 56 feet in length), 70 medium length vessels (56 to 74 feet in length), and 53 large vessels (vessels over 74 feet). Inactive vessels or those vessels with no Hawaii landings of longline-caught fish, included 19 small, 14 medium and 12 large category vessels.

During the year, several longline vessels from Hawaii landed fish in Alaska to explore the feasibility of expediting their catches from a location closer to the northern limits of the Hawaii-based fishery. Throughout the summer months, many Hawaii longline vessels may log in over 10 days of travel time in order to reach the most productive fishing areas. This represents a substantial investment since fuel is typically one of the most expensive costs in operating the vessel. If the results of the 1993 Alaska landings prove to be practical, it's possible that more Hawaii-based vessels will be using Alaska as a summer landing site in the future.

On nine occasions, domestic longline vessels with LE permits were contracted to transship shark fins from foreign longline fishing vessels, and two LE vessels transhipped longline caught fish from Hawaii-based vessels. This was a significant increase over 1992 when only two vessels reported any transshipment activities. For some vessel owners, shark fin transshipping is often more appealing than longlining because they have a guaranteed income, and they don't have to purchase any bait, fishing gear (i.e., hooks, light sticks, etc.), or ice. In addition, other expenses are reduced because the duration of these types of operations usually last less than a week, and only one or two crew are needed. Whereas, typical longline trips may last 10 to 40 days and four or five crew are usually required.

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[1]Numbers of active, inactive, and permitted vessels may not be in full agreement in all cases because not all permittees have functional vessels (e.g., vessel may have sunk) or one permittee may have had two active vessels during the year, one of which was a replacement vessel.

NUMBER OF TRIPS

Logbook data received and summarized (by date of landing)[2] by trips and vessels operating in all areas (the MHI EEZ, the NWHI EEZ, areas outside the EEZ, and areas in other U.S. territories) during 1993, are compared with similar criteria for previous years as follows:

Category	1991	1992	1993
Vessels	140.0	123.0	122.0
Trips	1,664.0	1,260.0	1,192.0
Average days fished per trip	7.6	9.1	10.3

Logbook data for 1993 were separated into trip type categories according to targeted species: tuna, swordfish, or mixed (targeting swordfish and tuna on the same trip or when target species not identified). Identification or determination of target species usually is obtained by FMEP personnel from dockside interviews with the captain or deck boss. When the captain is unavailable for an interview, or the log sheets are mailed in, multiple criteria are subjectively evaluated by FMEP staff. The trip type is determined by analyzing the catch composition, set times, number of hooks and light sticks used, area fished, duration of trip, and previous history of trip types for that vessel. For example, targeting of swordfish is presumed when the gear is soaked at night, when over 50 percent of the hooks are deployed with lightsticks, when the vessel fishes in geographical areas of known concentrations of swordfish (i.e., confluence of major ocean currents), when the duration of the trip is more than 3 weeks, and when swordfish comprise a significant percentage of the catch (i.e., 50 percent). If these criteria are not clearly indicative, then the previous history of the vessel is also considered. When the criteria suggest that both swordfish and tuna were targeted, trips are categorized as mixed. Targeting of tuna is presumed if the gear is set and retrieved during the day; no lightsticks are used; the duration of the trip is less than 3 weeks; or if the vessel fishes in areas traditionally known for tuna fishing, and the majority of the catch is tuna.

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[2]Date of landing is used in this report when summarizing total number of trips and landings. Date of haul is used when summarizing more detailed parameters like CPUE. For example, if CPUE of swordfish in March 1993 is desired, a report by date of haul would be appropriate since it would contain all of the information needed (hooks set and number of swordfish caught in March 1993). However, if date landing is used to find the CPUE, the report would inappropriately include fishing in February 1993 from vessels which landed in March and exclude some fishing in March 1993 by vessels which landed in April.

Current summaries of trip types by date of haul (see footnote 2) for 1993 show that 28 percent of the trips targeted swordfish, 44 percent were tuna directed, and 28 percent were mixed trips. One LE-permitted longline vessel completed a trip on which the operator targeted only sharks.

FISHING EFFORT

Total fishing effort increased by over 10 percent from 11.7 million hooks set in 1992 to 13 million hooks set in 1993 (Table 2).[3] The number of sets completed (days fished) increased by about 7 percent in 1993 compared to 1992. Figure 3 depicts fishing effort by number of trips, sets and vessels for all areas fished. Figure 4A compares 1991-93 quarterly fishing effort by number of hooks set.

Tables 3 and 4 show catch and effort for the MHI and NWHI respectively, and Table 5 shows catch and effort inside the Hawaii EEZ. Table 6 depicts catch and effort outside the Hawaii EEZ. Over 43 percent of the fishing effort for 1993 was within the 200-mile EEZ of the MHI (a 1 percent increase), where bigeye tuna comprised the most landings. About 10 percent of the fishing effort was within the 200-mile EEZ of the NWHI (a 4 percent increase), where swordfish constituted the largest number of landings, and about 47 percent of the effort was outside the Hawaii EEZ (a 5 percent decrease), with the predominate landings also being swordfish (Fig. 4B). Tables 7-9 summarize catch, effort, landings, and CPUE (number caught per 1,000 hooks) for each type of trip (broadbill, tuna, and mixed).

During the third quarter of 1993, there were approximately 33 percent fewer longline trips completed and 10 percent fewer longline vessels fishing compared to the other quarters. Similar third quarter effort reductions were observed in previous years during the moratorium. According to Hawaii longline vessel operators, this annual phenomenon is prompted by other longline fisheries becoming more productive (e.g., South American swordfish) during this time period, causing more longline-caught fish to inundate domestic markets. In addition, CPUE for the major target species of Hawaii-based longliners (i.e., swordfish and bigeye tuna) during the third quarters have been typically depressed. Consequently, some vessel owners and operators take this occasion to repair, dry-dock, and complete annual maintenance requirements for their vessels and equipment.

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[3]Figures rounded off for purposes of comparison. All summary tables are by date of haul.

CATCH AND LANDINGS

Table 2 summarizes 1993 catch, effort, landings and CPUE for pelagic species caught for all areas. Swordfish continued to be the largest component of the landings in 1993 (N = 75,700), followed by bigeye tuna (N = 53,600) and mahimahi (N = 24,500). Almost twice the number of swordfish were landed in the first half of 1993 (N = 49,400) than were landed in the second half (N = 26,300). The total number of swordfish caught and retained comprised almost 30 percent of the total number of fish landed (N = 256,400). Landings for bigeye and yellowfin tunas increased throughout the year and comprised 21 percent and 6 percent, respectively, of the 1993 landings. Landings for "other billfish" (blue and striped marlins, spearfish, etc.) were more similar throughout the year with the number of striped marlins caught predominately more abundant during the second and fourth quarters.

Only 7 percent more swordfish were caught in 1993 but significantly more bigeye (20 percent) and yellowfin tuna (more than double the 1992 figure) were hooked. The number of marlins caught increased about 10 percent over 1992, while mahimahi declined dramatically by over 54 percent.

The number of sharks reported caught in 1993 jumped by almost 39 percent over 1992 and accounted for the largest component of the longline catch (N = 154,600), but relatively few were landed (N = 16,700). By far, blue sharks were the most abundant species of shark caught (N = 150,000+) and represented over 36 percent of the total catch for 1993, compared to the combined catch of about 1 percent for mako, thresher, and miscellaneous sharks (oceanic white tip, silky shark, etc.) during the same period. The exact number of sharks caught and released on some trips (dead, alive, or finned) may not always be entered in the logs or sometimes only a rough estimate may be recorded during especially hectic periods when more valuable fish are being caught and processed. For example, the number of blue sharks recorded as released is frequently only **estimated** by the captain or deck boss since the hook and branch line is ordinarily cut off by a crew member when a blue shark is hooked. Reportedly, the effort to land and process a live shark on board is not worth the time and trouble unless it is one of the more valuable species that can be sold at local or mainland markets (e.g., mako or thresher shark). Hawaii markets do not buy blue shark carcasses as there is no viable local application for this species at present with the exception of the fins. On occasion, when fishing for tuna, swordfish, or other pelagic species is poor, fishermen will take blue sharks to fin as a last resort. Almost all of the shark fins landed in Hawaii are shipped out by local traders or shipping agents to Asian markets.

Federal longline data show that more sharks were reported landed in 1993 than any previous year during the moratorium and that there was more than a fourfold increase in the number of sharks reported kept compared to 1992. According to longline logbook data for 1993, over 14,300 blue sharks were reported kept (i.e., finned). Using average whole weights of blue sharks from longline observer data (FMEP, unpublished records) collected during 1990-91 (N = 450), an estimate of the total whole weight of blue sharks finned by the Hawaii longline fleet during 1993 was calculated to be around 1.35 million pounds.

Figure 5 depicts seasonal patterns in the longline fishery (by number caught) for each quarter, and Figure 6 shows the species composition (percent of total number caught) for 1993.

Preliminary average sampling weights from dockside and wholesale market monitoring in Honolulu suggest that landings of swordfish in 1993 increased to approximately 13.1 million pounds (round weight) with an ex-vessel revenue of $26.6 million. Landings of bigeye tuna (4.8 millions pounds) worth $17.2 million gained over 1992, while landings of yellowfin tuna (1.5 million pounds) worth $4.1 million increased significantly (NMFS unpublished data).

CATCH-PER-UNIT-EFFORT (CPUE)

Billfish (e.g., blue and striped marlins, swordfish) CPUE (number caught per 1,000 hooks) for all areas in 1993 remained about the same as 1992 at 8.3. The CPUE for other pelagic management unit species (PMUS); i.e., mahimahi, wahoo, and sharks, increased to 14.2 in 1993, and CPUE for tunas increased substantially to 8.2. Figure 7 compares quarterly CPUE for the majority of the species caught during 1991-93, and Figure 8 shows quarterly CPUE by trip types (swordfish, tuna or mixed) for 1991-93. The general trend (all areas) for the major target species during the past 3 years seems to indicate that swordfish has fallen slowly from a CPUE of about 17 in 1991 to around 13 in 1993, and CPUE for bigeye and yellowfin tuna has risen from about 3.4 and 0.7 in 1991 to 4.5 and 1.3, respectively, in 1993.

INTERACTIONS WITH ENDANGERED AND PROTECTED SPECIES

A Biological Opinion and Incidental Take Statement (752 turtles) was issued in June 1993 by the NMFS that indicated the Hawaii longline fishery is not likely to adversely affect any endangered or threatened species of sea turtle, nor will it have any detrimental effect on any critical habitat of any protected sea turtle species during the 1-year term of the opinion. Nevertheless, special measures were required for the continued operation of the longline fishery (refer to Recent Developments section) during the remainder of 1993 and into 1994. As a

result of this opinion, the council concurred with the establishment of a mandatory observer program and an electronic vessel monitoring system (VMS) requirement for the Hawaii longline fishery. The conservation of sea turtles is of particular concern, and as a result, NMFS included a conservation recommendation that the FMP be amended to prevent increases in longline effort until it is demonstrated that turtle interactions are being managed at a level that will allow recovery of the species. The Biological Opinion is being reviewed in mid-1994 after sufficient information from longline observer trips has been collected and evaluated.

Summaries of interactions with endangered and threatened species in the western longline fishery (Table 10) are based on information received from the daily longline catch reports. Interactions are defined in this report as any endangered or threatened species caught (hooked or entangled in longline fishing gear) and released alive, injured, or dead. Fishermen may often sight or interact with greater numbers of protected species than are indicated in the longline logbook summary tables. In fact, suspected underreporting of these species was one of the major factors which led to the establishment of the mandatory observer program. Consequently, the number of sightings or interactions shown in the summary tables are not necessarily an accurate indication of the actual number of interactions.

During calendar year 1993, Hawaii-based longline vessels reported a total of 264 interactions with endangered and protected marine species. Interaction data from logbooks submitted to NMFS indicated that 67 percent of the interactions were with seabirds, 30 percent with marine turtles, and 3 percent with whales or dolphins.

All interactions with protected species were reported as number of animals released alive, injured, or dead, since it is unlawful to retain protected species. Logbook data showed 54 percent of the interactions resulted in animals that were released alive, 3 percent released injured, and 43 percent released dead (3 green turtles, 1 leatherback turtle, and 110 birds).

Over 69 percent of the reported interactions occurred outside the U.S. EEZ while 31 percent were inside the zone. The rate of interaction for turtles was calculated at 0.12 per 100,000 hooks inside the EEZ, whereas outside the EEZ, the rate was 1.15 turtles per 100,000 hooks set. The overall number of reported interactions increased 32 percent from 1992 as reflected by a increase in fishing effort during 1993. Although the amount of effort within the EEZ during 1993 increased, turtle interactions declined. Whereas, fishing effort outside the EEZ was approximately the same as 1992, and turtle interaction rates

increased. Table 11 summarizes protected species interactions for January 1991-December 1993.

ACKNOWLEDGMENTS

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TABLES

Table 1.--List of common and scientific names of fishes and endangered or protected species commonly encountered by fishing vessels in the western Pacific longline fishery.

Common name	Scientific name
Pelagic Management Unit Species	
Swordfish	*Xiphias gladius*
Blue marlin	*Makaira mazara*
Black marlin	*Makaira indica*
Striped marlin	*Tetrapturus audax*
Shortbill spearfish	*T. angustirostris*
Sailfish	*Istiophorus platypterus*
Mahimahi	*Coryphaena hippurus*
Wahoo (ono)	*Acanthocybium solandri*
Blue shark	*Prionace glauca*
Thresher (big eye)	*Alopias superciliosus*
Mako (short fin)	*Isurus oxyrinchus*
White tip (oceanic)	*Carcharhinus longimanus*
Tiger shark	*Galeocerdo cuvieri*
Miscellaneous sharks	Carcharhinidae, Alopiidae, Sphynidae and Laminidae
Tunas	
Bigeye tuna	*Thunnus obesus*
Yellowfin tuna	*T. albacares*
Northern bluefin tuna	*T. thunnus orientalis*
Albacore	*T. alalunga*
Kawakawa	*Euthynnus affinis*
Skipjack tuna	*Katsuwonus pelamis*
Miscellaneous	
Moonfish	*Lampris guttatus*
Lancetfish	*Alepisaurus* spp.
Oilfish	*Lepidocybium flavobrunneum*
Pomfret	*Taractes steindachneri*
Barracuda	*Sphyraena barracuda*
Brown stingray	*Dasyatis violacea*
Endangered or Protected Species	
Hawaiian monk seal	*Monachus schauinslandi*
Humpback whale	*Megaptera novaengliae*
Killer whale	*Orcinus orca*
False killer whale	*Pseudorca crassidens*
Bottlenose dolphin	*Tursiops truncatus*
Rough-toothed dolphin	*Steno bredanensis*
Spinner dolphin	*Stenella longirostris*
Green turtle	*Chelonia mydas*
Olive ridley turtle	*Lepidochelys olivacea*
Hawksbill turtle	*Eretmochelys imbricata*
Leatherback turtle	*Dermochelys coricea*
Laysan albatross	*Diomedea immutabilis*
Black-footed albatross	*D. nigripes*
Brown booby	*Sula leucogaster plotus*

Table 2.--Hawaii's domestic longline logbook summary by date of haul; from January-December 1993 (all areas).

Trip information	
Number of vessels	122
Number of trips	1,233
Number of sets	12,322
Number of hooks set	13,029,532
Number of light sticks used	3,483,730
Minimum hooks per set	16
Maximum hooks per set	2,200

Species catch information			
Species class Species	No. kept	No. caught	No. caught per 1,000 hooks
Billfish			
Blue Marlin[1]	4,816	5,124	0.39
Swordfish	75,745	79,587	6.11
Striped marlin	16,491	18,211	1.40
Other	5,397	5,686	0.44
Total	102,449	108,608	8.34
Other Pelagic Management Unit Species			
Mahimahi	24,521	26,018	2.00
Wahoo	4,366	4,442	0.34
Sharks[2]	16,762	154,620	11.87
Total	45,649	185,080	14.20
Tunas			
Albacore	22,214	30,463	2.34
Bigeye	53,642	54,804	4.21
Yellowfin	15,617	16,126	1.24
Other	5,257	5,356	0.41
Total	96,730	106,749	8.19
Miscellaneous	11,613	12,477	0.96

[1]Blue and striped marlins are misidentified in some cases.
[2]Sharks are logged as "kept" in some cases where they are finned. Number of sharks reported "caught" is often estimated.

Table 3.--Hawaii's domestic longline logbook summary by date of haul; from January-December 1993 (Main Hawaiian Islands).

Trip information	
Number of vessels	99
Number of trips	688
Number of sets	4,413
Number of hooks set	5,556,786
Number of light sticks used	222,770
Minimum hooks per set	150
Maximum hooks per set	2,160

Species catch information			
Species class Species	No. kept	No. caught	No. caught per 1,000 hooks
Billfish			
Blue marlin[1]	2,695	2,720	0.49
Swordfish	4,196	4,413	0.79
Striped marlin	10,188	10,427	1.88
Other	3,383	3,445	0.62
Total	20,462	21,005	3.78
Other Pelagic Management Unit Species			
Mahimahi	9,175	9,366	1.69
Wahoo	2,617	2,641	0.48
Sharks[2]	3,981	12,967	2.33
Total	15,773	24,974	4.49
Tunas			
Albacore	6,464	6,499	1.17
Bigeye	24,659	25,032	4.50
Yellowfin	8,695	8,959	1.61
Other	3,463	3,508	0.63
Total	43,281	43,998	7.92
Miscellaneous	7,530	8,053	1.45

[1]Blue and striped marlins are misidentified in some cases.
[2]Sharks are logged as "kept" in some cases where they are finned. Number of sharks reported "caught" is often estimated.

Table 4.--Hawaii's domestic longline summary by date of haul; from January-December 1993 (Northwestern Hawaiian Islands).

Trip information	
Number of vessels	92
Number of trips	217
Number of sets	1,277
Number of hooks set	1,305,786
Number of light sticks used	467,733
Minimum hooks per set	300
Maximum hooks per set	2,200

Species catch information			
Species class Species	No. kept	No. caught	No. caught per 1,000 hooks
Billfish			
Blue Marlin[1]	407	509	0.39
Swordfish	8,903	9,565	7.33
Striped Marlin	2,155	2,861	2.19
Other	646	754	0.58
Total	12,111	13,689	10.48
Other Pelagic Unit Species			
Mahimahi	2,098	2,279	1.75
Wahoo	182	198	0.15
Sharks[2]	2,089	17,507	13.41
Total	4,369	19,984	15.30
Tunas			
Albacore	965	1,413	1.08
Bigeye	7,432	7,760	5.94
Yellowfin	1,904	2,019	1.55
Other	415	442	0.34
Total	10,716	11,634	8.91
Miscellaneous	873	942	0.72

[1]Blue and striped marlins are misidentified in some cases.
[2]Sharks are logged as "kept" in some cases where they are finned. Number of sharks reported "caught" is often estimated.

Table 5.--Hawaii's domestic longline logbook summary by date of haul; from January-December 1993 (inside Hawaii EEZ).

Trip information	
Number of vessels	119
Number of trips	838
Number of sets	5,690
Number of hooks set	6,862,572
Number of light sticks used	690,503
Minimum hooks per set	150
Maximum hooks per set	2,200

Species catch information			
Species class Species	No. kept	No. caught	No. caught per 1,000 hooks
Billfish			
Blue Marlin[1]	3,102	3,229	0.47
Swordfish	13,099	13,978	2.04
Striped Marlin	12,343	13,288	1.94
Other	4,029	4,199	0.61
Total	32,573	34,694	5.06
Other Pelagic Management Unit Species			
Mahimahi	11,273	11,645	1.70
Wahoo	2,799	2,839	0.41
Sharks[2]	6,070	30,474	4.44
Total	20,142	44,958	6.55
Tunas			
Albacore	7,429	7,912	1.15
Bigeye	32,091	32,792	4.78
Yellowfin	10,599	10,978	1.60
Other	3,878	3,950	0.58
Total	53,997	55,632	8.11
Miscellaneous	8,403	8,995	1.31

[1]Blue and striped marlins are misidentified in some cases.
[2]Sharks are logged as "kept" in some cases where they are finned. Number of sharks reported "caught" is often estimated.

Table 6.--Hawaii's domestic longline summary by date of haul; from January-December 1993 (outside Hawaii EEZ).

Trip information	
Number of vessels	114
Number of trips	734
Number of sets	6,630
Number of hooks set	6,164,560
Number of light sticks used	2,793,227
Minimum hooks per set	16
Maximum hooks per set	2,160

Species catch information			
Species class Species	No. kept	No. caught	No. caught per 1,000 hooks
Billfish			
Blue marlin[1]	1,714	1,895	0.31
Swordfish	62,646	65,609	10.64
Striped marlin	4,145	4,920	0.80
Other	1,367	1,486	0.24
Total	69,872	73,910	11.99
Other Pelagic Management Unit Species			
Mahimahi	13,243	14,367	2.33
Wahoo	1,564	1,600	0.26
Sharks[2]	10,687	124,139	20.14
Total	25,494	140,106	22.73
Tunas			
Albacore	14,785	22,551	3.66
Bigeye	21,547	22,008	3.57
Yellowfin	5,017	5,147	0.83
Other	1,378	1,405	0.23
Total	42,727	51,111	8.29
Miscellaneous	3,210	3,482	0.56

[1]Blue and striped marlins are misidentified in some cases.
[2]Sharks are logged as "kept" in some cases where they are finned. Number of sharks reported "caught" is often estimated.

Table 7.--Hawaii's domestic longline summary by date of haul; from January-December 1993 (swordfish trips; all areas).

Trip information			
Number of vessels			80
Number of trips			352
Number of sets			4,564
Number of hooks set			3,954,966
Number of light sticks used			2,578,983
Minimum hooks per set			16
Maximum hooks per set			1,700

Species catch information			
Species class Species	No. kept	No. caught	No. caught per 1,000 hooks
Billfish			
Blue Marlin[1]	853	1,084	0.27
Swordfish	49,511	52,132	13.18
Striped Marlin	2,443	3,813	0.96
Other	514	662	0.17
Total	53,321	57,691	14.59
Other Pelagic Management Unit Species			
Mahimahi	7,930	9,053	2.29
Wahoo	481	514	0.13
Sharks[2]	10,641	103,570	26.19
Total	19,052	113,137	28.61
Tunas			
Albacore	8,119	14,623	3.70
Bigeye	9,795	10,314	2.61
Yellowfin	2,680	2,865	0.72
Other	289	328	0.08
Total	20,883	28,130	7.11
Miscellaneous	402	760	0.19

[1]Blue and striped marlins are misidentified in some cases.
[2]Sharks are logged as "kept" in some cases where they are finned. Number of sharks reported "caught" is often estimated.

Table 8.--Hawaii's domestic longline summary by date of haul; from January-December 1993 (tuna trips; all areas).

Trip information	
Number of vessels	62
Number of trips	552
Number of sets	4,750
Number of hooks set	6,458,216
Number of light sticks used	32,176
Minimum hooks per set	150
Maximum hooks per set	2,200

Species catch information			
Species class Species	No. kept	No. caught	No. caught per 1,000 hooks
Billfish			
Blue Marlin[1]	2,647	2,674	0.41
Swordfish	1,156	1,383	0.21
Striped Marlin	11,611	11,900	1.84
Other	4,187	4,252	0.66
Total	19,601	20,209	3.13
Other Pelagic Management Unit Species			
Mahimahi	9,557	9,780	1.51
Wahoo	3,527	3,559	0.55
Sharks[2]	5,693	16,559	2.56
Total	18,777	29,898	4.63
Tunas			
Albacore	9,184	10,348	1.60
Bigeye	29,708	30,209	4.68
Yellowfin	9,299	9,592	1.49
Other	4,748	4,805	0.74
Total	52,939	54,954	8.51
Miscellaneous	10,876	11,375	1.76

[1]Blue and striped marlins are misidentified in some cases.
[2]Sharks are logged as "kept" in some cases where they are finned. Number of sharks reported "caught" is often estimated.

Table 9.--Hawaii's domestic longline summary by date of haul; from January-December 1993 (mixed trips; all areas).

Trip information	
Number of vessels	60
Number of trips	350
Number of sets	3,008
Number of hooks set	2,616,350
Number of light sticks used	872,571
Minimum hooks per set	250
Maximum hooks per set	2,160

Species catch information			
Species class Species	No. kept	No. caught	No. caught per 1,000 hooks
Billfish			
Blue Marlin[1]	1,316	1,366	0.52
Swordfish	25,078	26,072	9.97
Striped Marlin	2,437	2,498	0.95
Other	696	772	0.30
Total	29,527	30,708	11.74
Other Pelagic Management Unit Species			
Mahimahi	7,034	7,185	2.75
Wahoo	358	369	0.14
Sharks[2]	428	34,491	13.18
Total	7,820	42,045	16.07
Tunas			
Albacore	4,911	5,492	2.10
Bigeye	14,139	14,281	5.46
Yellowfin	3,638	3,669	1.40
Other	220	223	0.09
Total	22,908	23,665	9.05
Miscellaneous	335	342	0.13

[1]Blue and striped marlins are misidentified in some cases.
[2]Sharks are logged as "kept" in some cases where they are finned. Number of sharks reported "caught" is often estimated.

Table 10.--Hawaii's longline logbook summary for protected species interactions from January-December 1993 (all areas; all species).

Trip Information	
Number of vessels reporting sightings	28
Number of vessels reporting RAID interactions[a]	24
Number of trips reporting sightings	47
Number of trips reporting RAID interactions	66
Number of sets reporting sightings	99
Number of sets reporting RAID interactions	148
Number of RAID interactions reported	264
Number of hooks set with interactions	212,439

Reported protected species interactions					
Species	Sighted in area of gear	Released alive	Or injured	Lost dead	Total
Seals					
Monk seals	1	0	0	0	0
Other seals	0	0	0	0	0
Total	1	0	0	0	0
Whales/Dolphins					
Whales	29	3	0	0	3
False killer whales	78	0	0	0	0
Dolphins	601	5	0	0	5
Total	708	8	0	0	8
Turtles					
Green turtles	37	26	0	3	29
Leatherback turtles	22	34	1	1	36
Loggerhead turtles	2	11	0	0	11
Ridley turtles	0	0	0	0	0
Other turtles	0	3	0	0	3
Total	61	74	1	4	79
Birds					
Albatross	NA[b]	61	5	109	175
Booby	NA	0	0	1	1
Other birds	NA	0	1	0	1
Total	NA	61	6	110	177

[a]**RAID** = Released alive, injured or dead
[b]**NA** = Not applicable

Table 11.--Hawaii's longline logbook summary for protected species interactions from January 1991 through December 1993 (all areas; all species).

Trip Information	
Number of vessels reporting sightings	83
Number of vessels reporting RAID interactions[a]	91
Number of trips reporting sightings	155
Number of trips reporting RAID interactions	221
Number of sets reporting sightings	277
Number of sets reporting RAID interactions	459
Number of RAID interactions reported	698
Number of hooks set with interactions	585,136

Reported protected species interactions

Species	Sighted in area of gear	Released alive	Or injured	Lost dead	Total
Seals					
Monk seals	0	0	0	0	0
Other seals	98	0	0	0	0
Total	98	0	0	0	0
Whales/Dolphins					
Whales	83	9	0	0	9
False killer whales	329	7	0	0	7
Dolphins	1,406	8	0	1	9
Total	1,818	24	0	1	25
Turtles					
Green turtles	82	74	0	4	78
Leatherback turtles	58	109	2	2	113
Loggerhead turtles	5	18	0	0	18
Ridley turtles	0	2	0	1	3
Other turtles	17	7	1	0	8
Total	162	210	3	7	220
Birds					
Albatross	NA^[b]	104	19	297	420
Booby	NA	4	3	11	18
Other birds	NA	0	1	1	2
Total	NA	108	23	309	440

[a]RAID = Released alive, injured or dead
[b]^NA = Not applicable

FIGURES

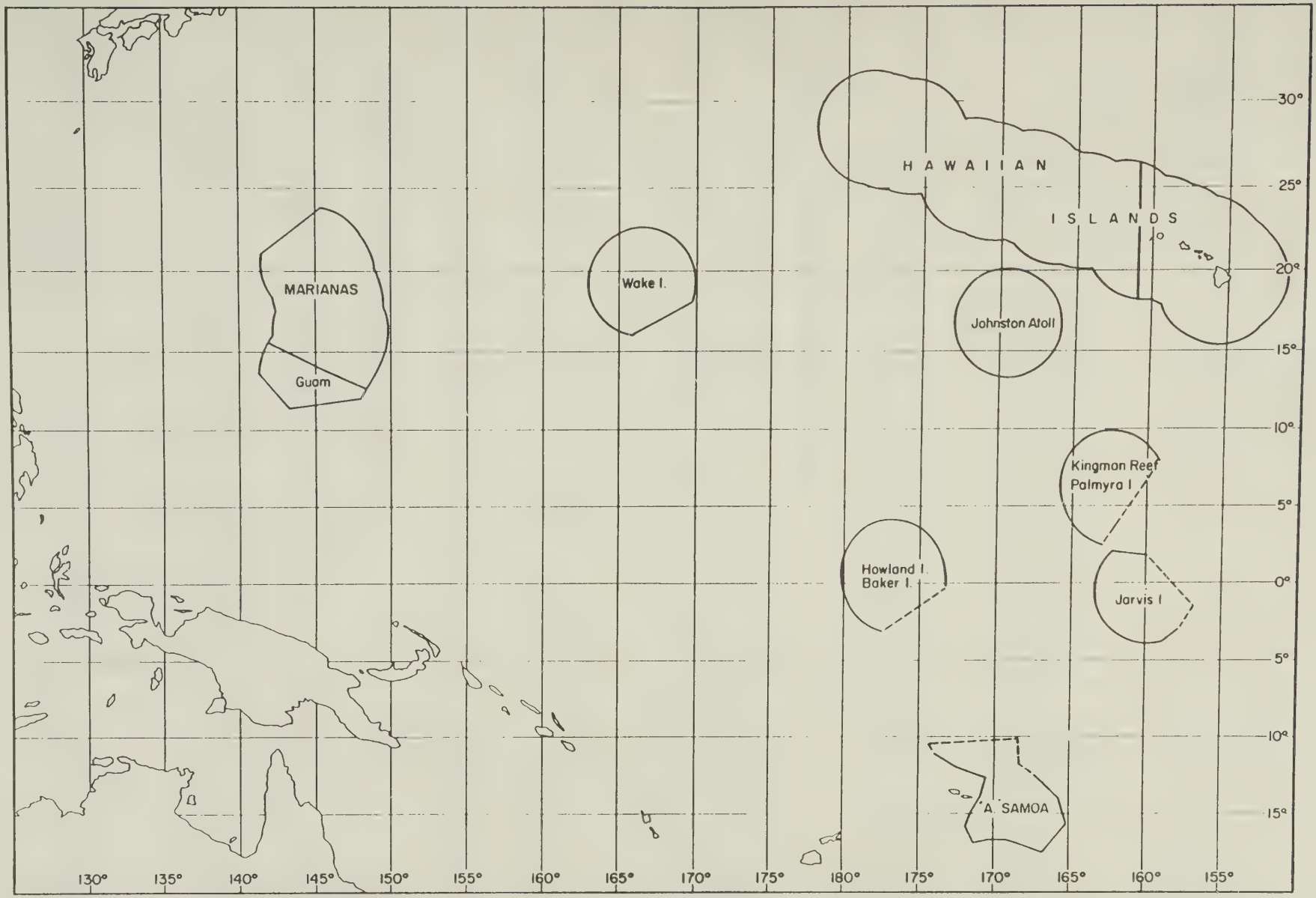

Figure 1.--Exclusive economic zones (3-200 nmi offshore around the Hawaiian Islands and U.S. possessions).

KEY FEDERAL REQUIREMENTS GOVERNING VESSELS IN THE HAWAII LONGLINE FISHERY

This summary is provided as a quick reference; it does not contain all the requirements governing the longline fishery. Fishermen are advised that requirements may change. Any discrepancy between this summary and regulations in the Federal Register will be resolved in favor of the regulations published in the Federal Register.

LONGLINE PERMIT

A vessel owner must have on board his or her vessel a general Federal Longline Fishing Permit to fish for Pacific pelagic management unit species or to possess, receive, transship, or land management unit species taken by longline gear shoreward of the outer boundary of the fishery management area of the Hawaiian Islands.

Note: **Effective June 24, 1994, all participants in the Hawaii longline fishery will be required to have on board their vessels a valid Hawaii longline limited entry permit. No general longline permit will be required.**

LONGLINE FISHING PROHIBITED AREAS

From October 1 through January 31 of the following year, longline fishing is prohibited within waters approximately 25 nautical miles from the windward shore of Kauai County, Maui County, and Hawaii County, and 50 nautical miles off the windward coast of Oahu; and within waters approximately 75 nautical miles off the leeward coasts of Kauai County and Oahu and 50 nautical miles of Maui County and Hawaii.

From February 1 through September 30 each year, longline fishing is prohibited within waters approximately 75 nautical miles from Kauai County and Oahu, and within 50 nautical miles of Maui County and Hawaii.

Northwestern Hawaiian Islands - No longline fishing is allowed within 50 nautical miles (nm) off Necker Island to Kure Island or waters between these islands.

LOGBOOK REPORTING AND SUBMISSION

The vessel captain must record catch and effort information in the logbook within 24 hours of hauling in the longline gear.

The vessel captain must submit completed logbook sheets to the Pacific Area Office by mail, unless collected by a National Marine Fisheries Service employee authorized by the Regional Director to gather logsheets, within 72 hours following his or her return to port after each trip.

Summary 12/92 rev 5/20/94

(Over)

Figure 2.--Current regulations for Hawaii's domestic longline fleet.

NOTIFICATION TO NMFS

The vessel captain must call 973-2939 (Pacific Area Office) within 12 hours following his or her return to port after each trip and give the name of the vessel, name of caller, date and time of arrival, and port.

The vessel captain must call 541-2727 (NMFS Enforcement) when his or her vessel enters and leaves the 50-mile protected species zone around the Northwestern Hawaiian Islands (Necker Island to Kure Island) and give the name of vessel, name of caller, date and time of entry and exit, location by latitude and longitude to the nearest minute.

VESSEL OFFICIAL NUMBER (Coast Guard Document or Hawaii Registration Number)

The vessel's official number must be legibly painted (in a color that contrasts with the background) on the port and starboard sides in block Arabic numbers at least 18 inches high for vessels 65 ft. and longer, or at least 10 inches high for vessels smaller than 65 ft.

All longline floats and buoys, whether deployed in the ocean or on board the vessel, must be marked with the vessel's official number. The number must be legible, permanent, and be of a color that contrasts with the background material.

OBSERVER REQUIREMENT

The permit holder or a designated agent of the permit holder must notify the NMFS Port Field Station in Honolulu (808-522-8245 or toll free 1-800-541-6637) at least 72 hours, not including weekends and Federal holidays, before his or her vessel leaves from any port to begin a fishing trip. The following information must be provided to NMFS: boat name and official number; departure port, date, and time; and telephone number of the agent designated by the permit holder who will be available between 0800 to 1630 hours Hawaii time on weekdays for NMFS to contact for observer placement arrangements.

A permit holder must carry a NMFS observer on board his or her vessel when directed to do so by the Regional Director. The vessel may not leave port without an observer when the vessel owner or designated agent has been notified by NMFS of the obligation to carry an observer.

For further information on permits, prohibited areas, reports, markings, contact:
Pacific Area Office, Fisheries Management/Operations, Southwest Region, NMFS
2570 Dole Street
Honolulu, Hawaii 96822
Telephone: (808) 973-2939 FAX: 973-2941

For further information on observer requirement, contact:
NMFS Port Field Station, Honolulu
76 North King Street #200
Honolulu, Hawaii 96817
Telephone: (808) 522-8245 FAX: 522-8248

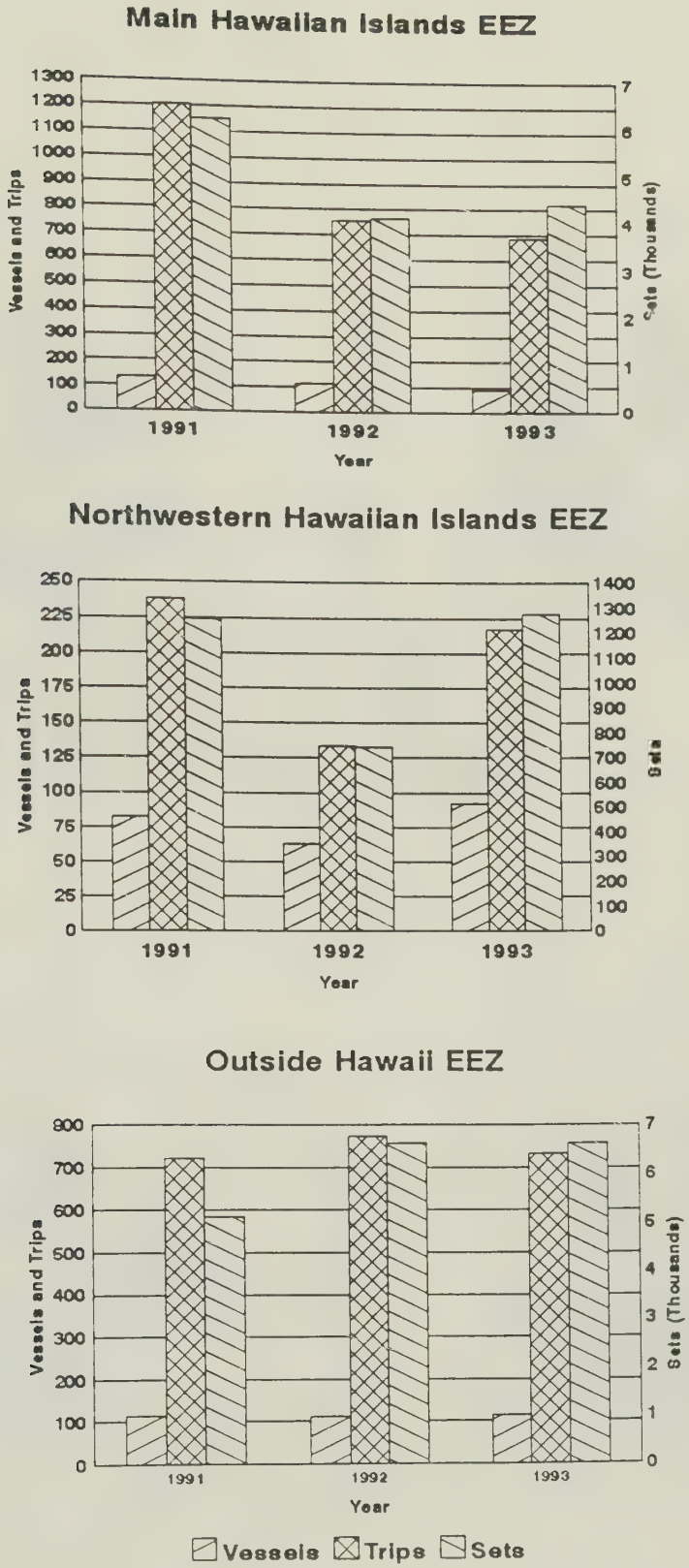

Figure 3.--Yearly fishing effort by number of trips, sets, and vessels, by Hawaii's domestic longline fleet (by area fished), January-December 1991-93.

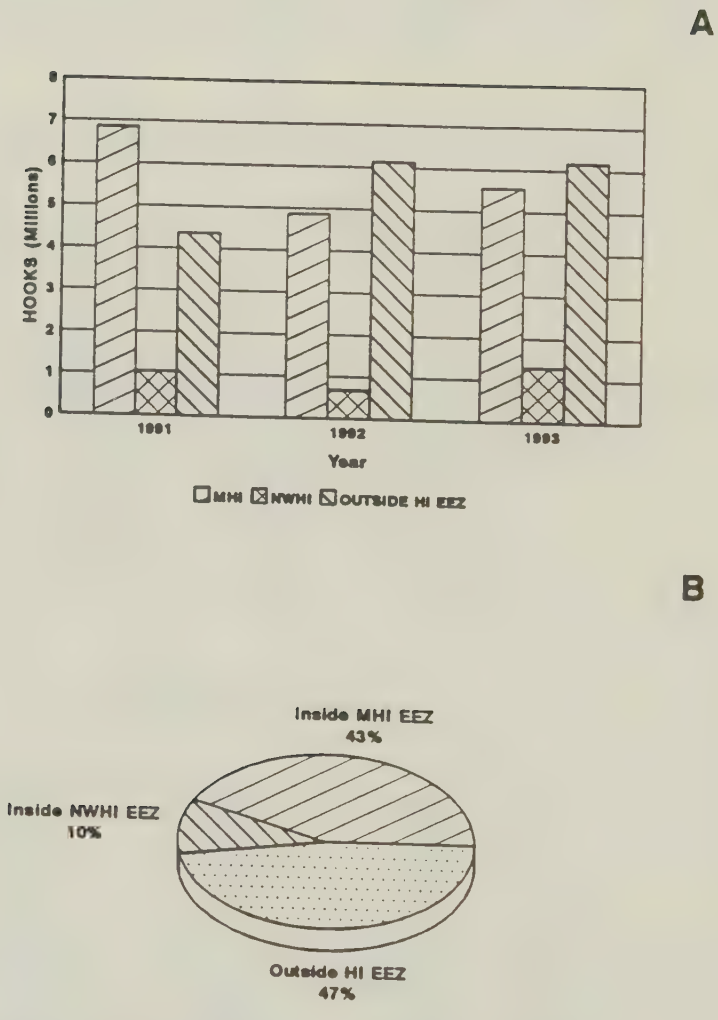

Figure 4.--Fishing effort by Hawaii's domestic longline fleet; (A) yearly effort by number of hooks set by area 1991-93; (B) percent of effort (number of hooks set) by area January-December 1993.

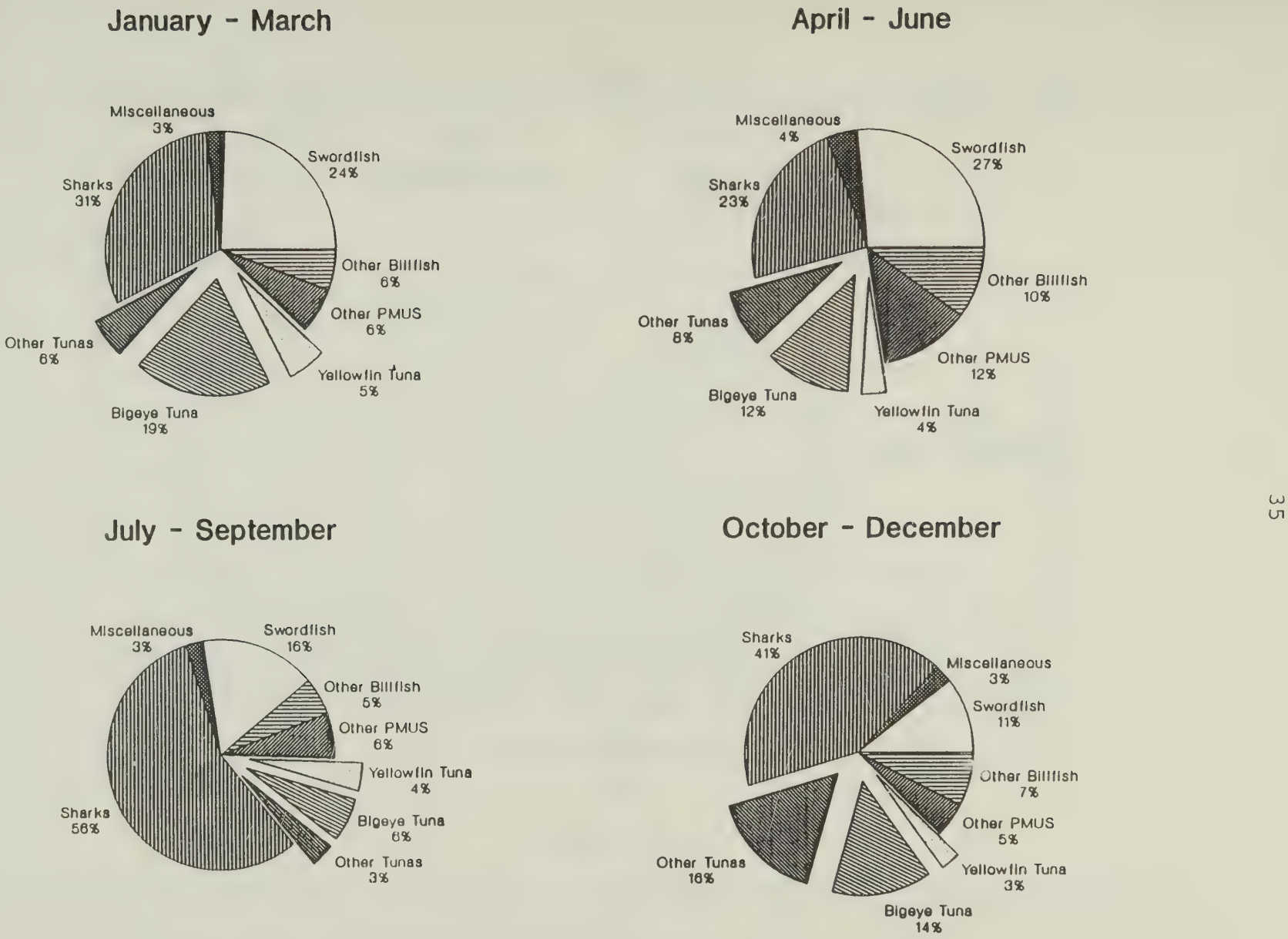

Figure 5.--Quarterly percent species composition (by number caught) by Hawaii's domestic longline fishing fleet, January-December 1993.

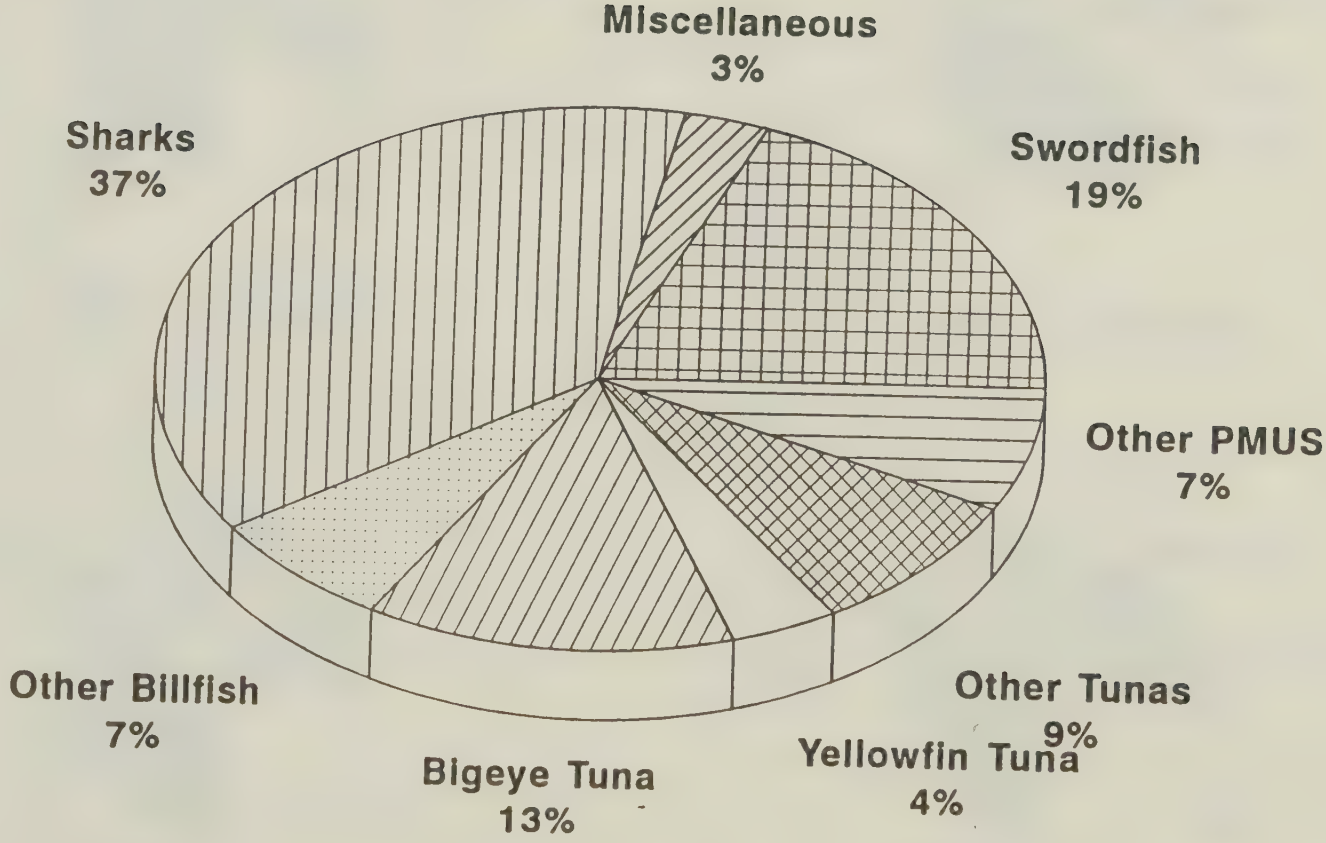

Figure 6.--Total percent species composition (by number caught) by Hawaii's domestic longline fishing fleet, January-December 1993.

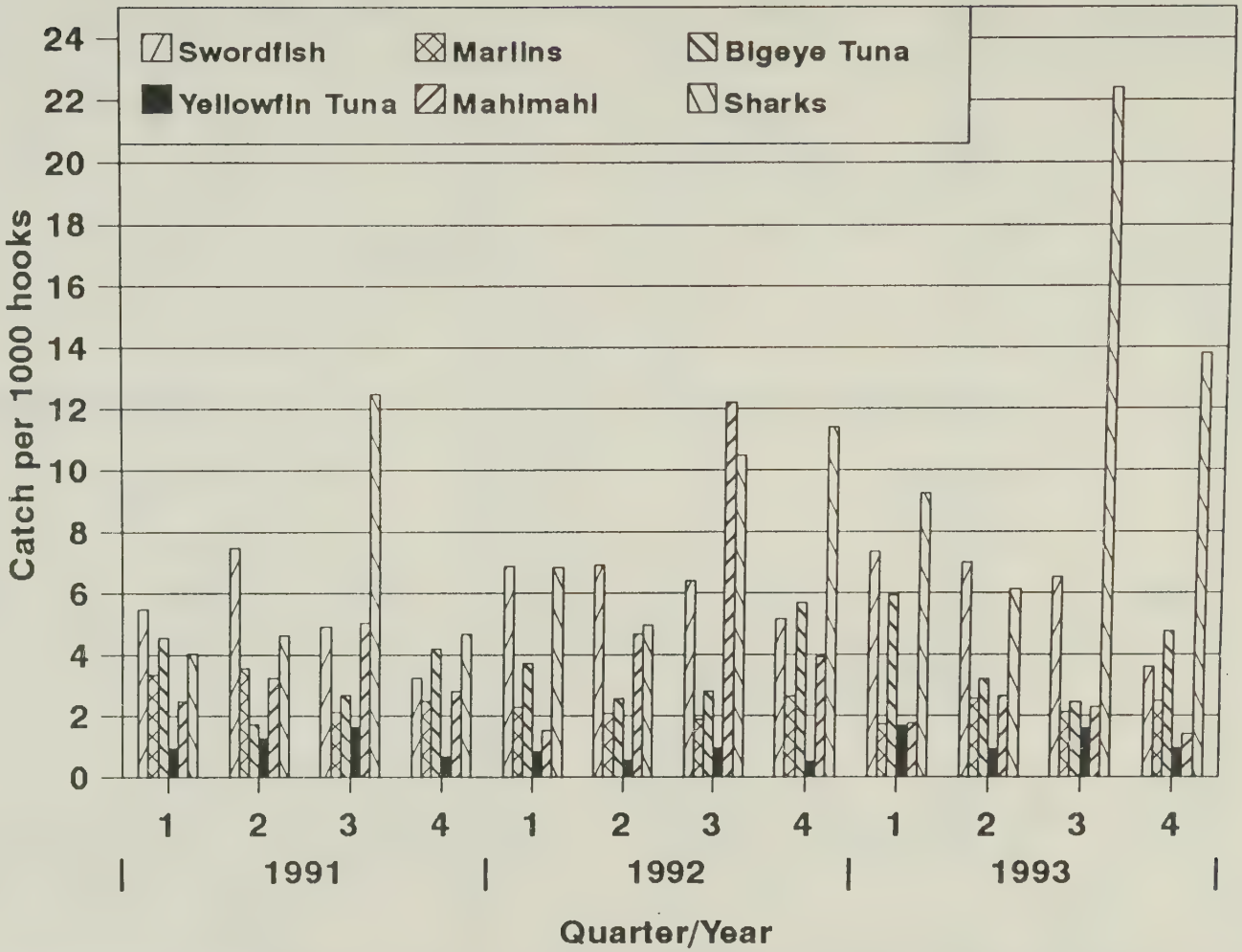

Figure 7.--Quarterly catch-per-unit-effort (CPUE; catch per 1,000 hooks) of selected species by Hawaii's domestic long-line fleet, January-December 1991-93.

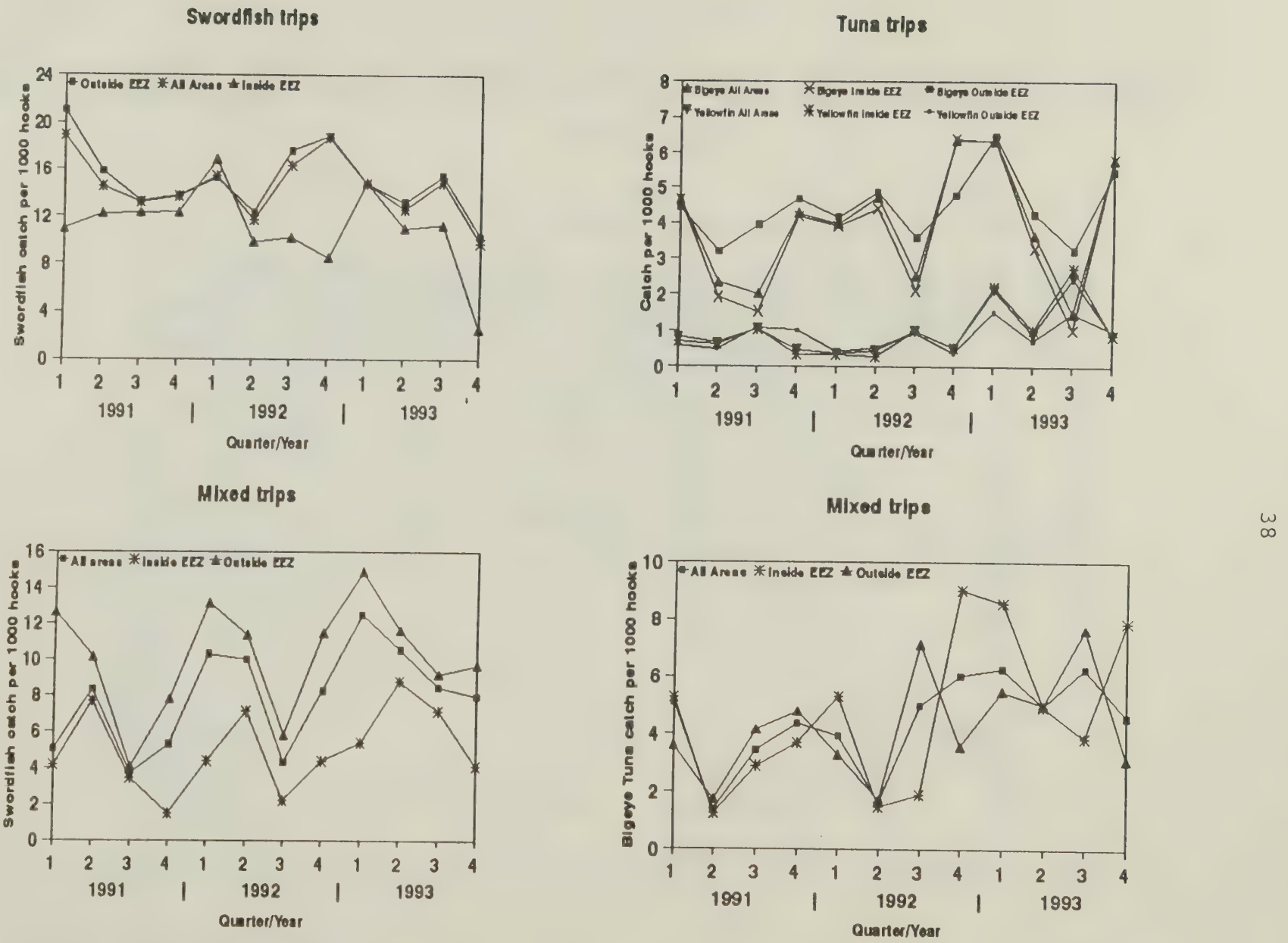

Figure 8.--Quarterly catch-per-unit-effort (CPUE; catch per 1,000 hooks) by trip type, by Hawaii's domestic longline fleet, January-December 1991-93.

Southwest Fisheries Science Center
Administrative Report H-94-06

ANNUAL REPORT OF THE 1993 WESTERN PACIFIC LONGLINE FISHERY

Robert A. Dollar

Honolulu Laboratory
Southwest Fisheries Science Center
National Marine Fisheries Service, NOAA
2570 Dole Street, Honolulu, Hawaii 96822-2396

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